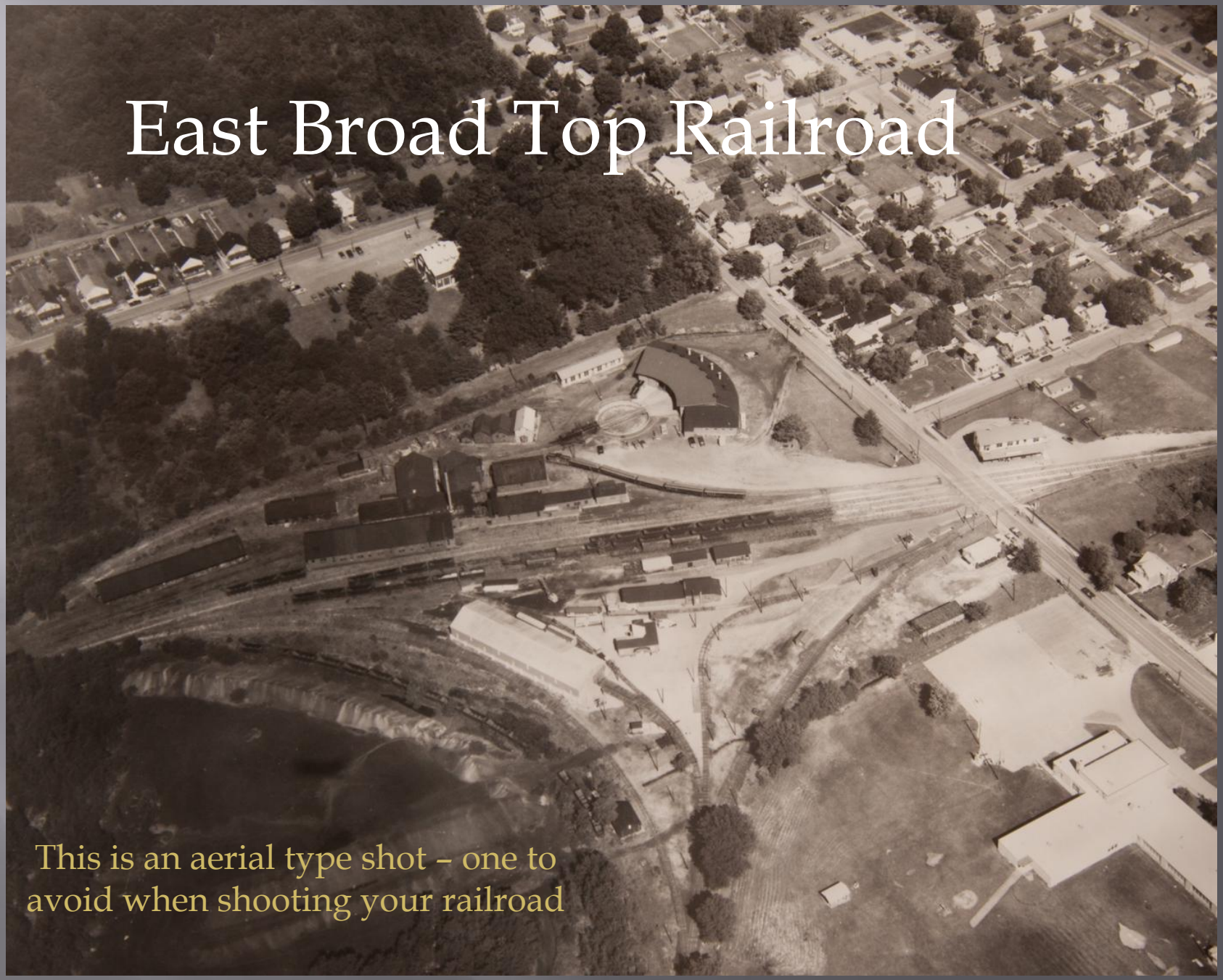
HOW TO MAKE YOUR LAYOUT PHOTOS BETTER PART 2

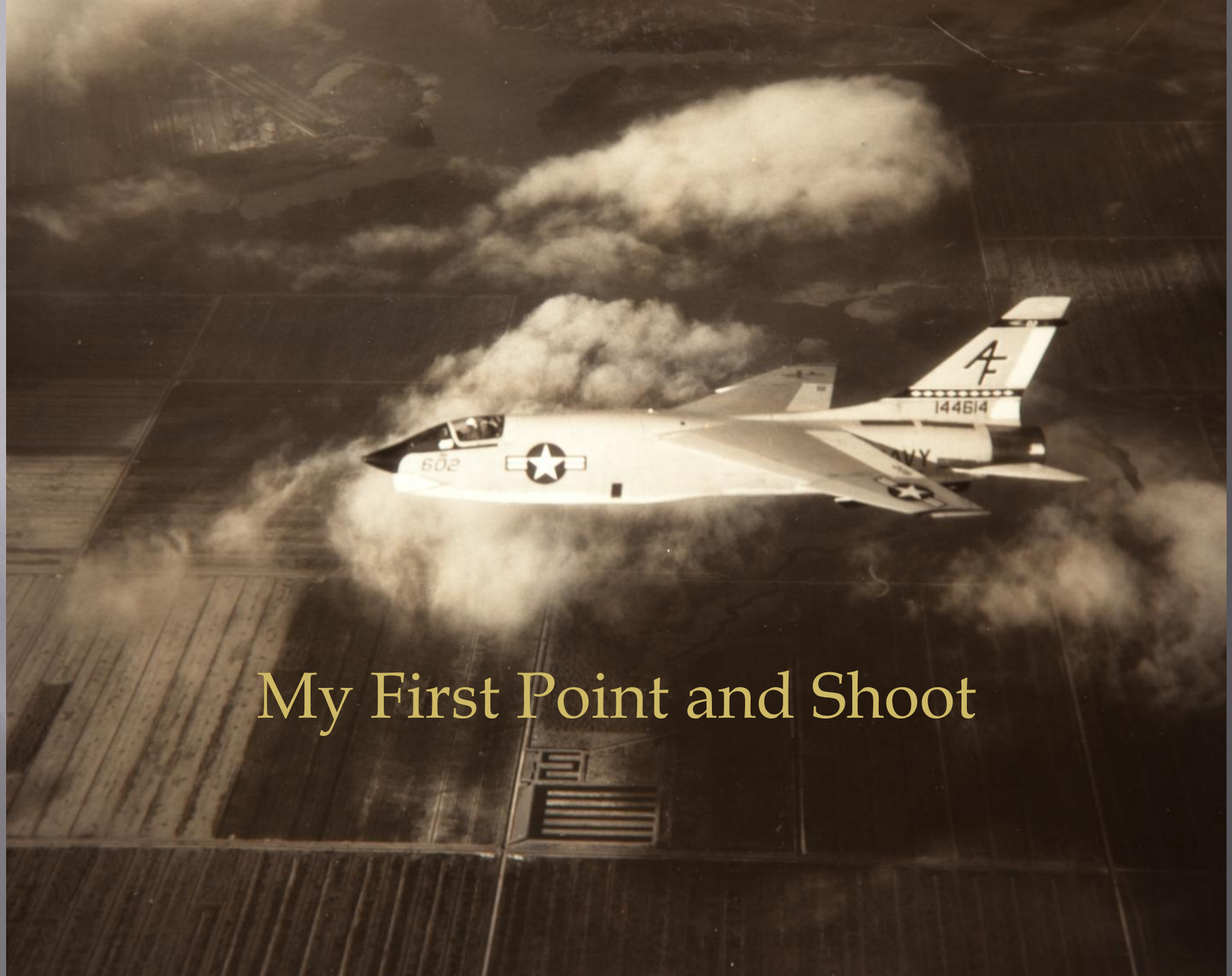
THE CAMERA

By Roy Stockard
LSR Division 3

East Broad Top Railroad



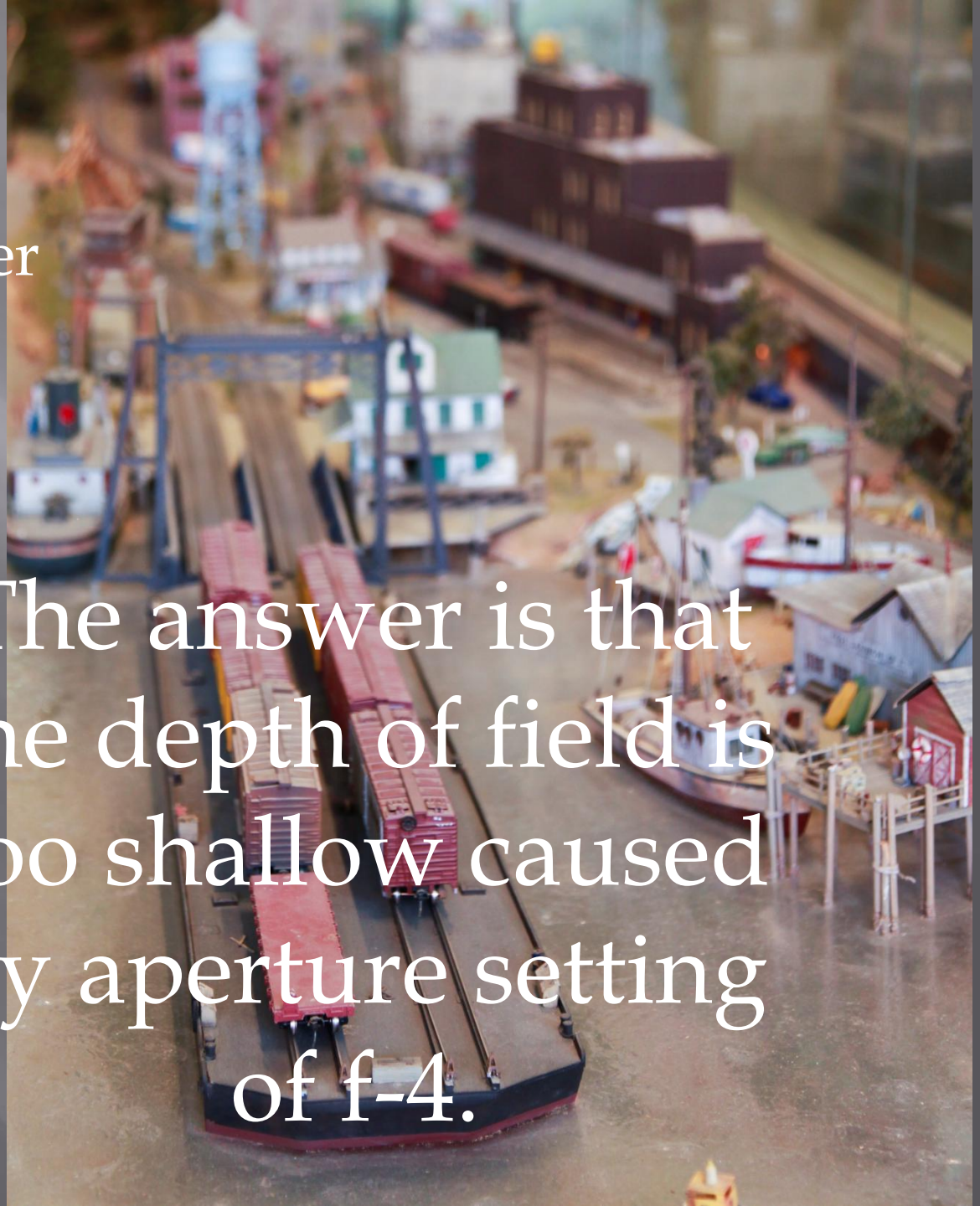
This is an aerial type shot – one to avoid when shooting your railroad



My First Point and Shoot

Why is this photo out of focus?

How about this one?
Why is the water tower
out of focus and
the barge in
focus?



The answer is that the depth of field is too shallow caused by aperture setting of f-4.

1. F-stop was 4 when it should have been at f-22 or smaller

2. Lighting was too low

3. Only one focal plane can be in focus at a time –

This is called
DEPTH OF FIELD

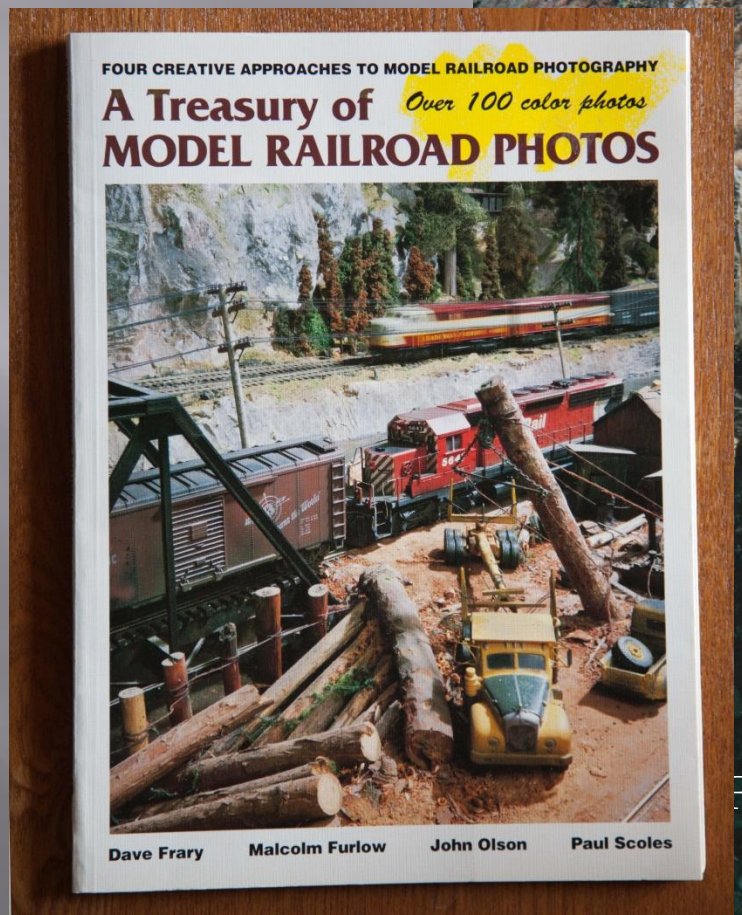
&
These photos are shot at a

SHALLOW DEPTH OF FIELD

This one is better but it still is not a great shot.

Helicon Focus Software used

Photography Basics



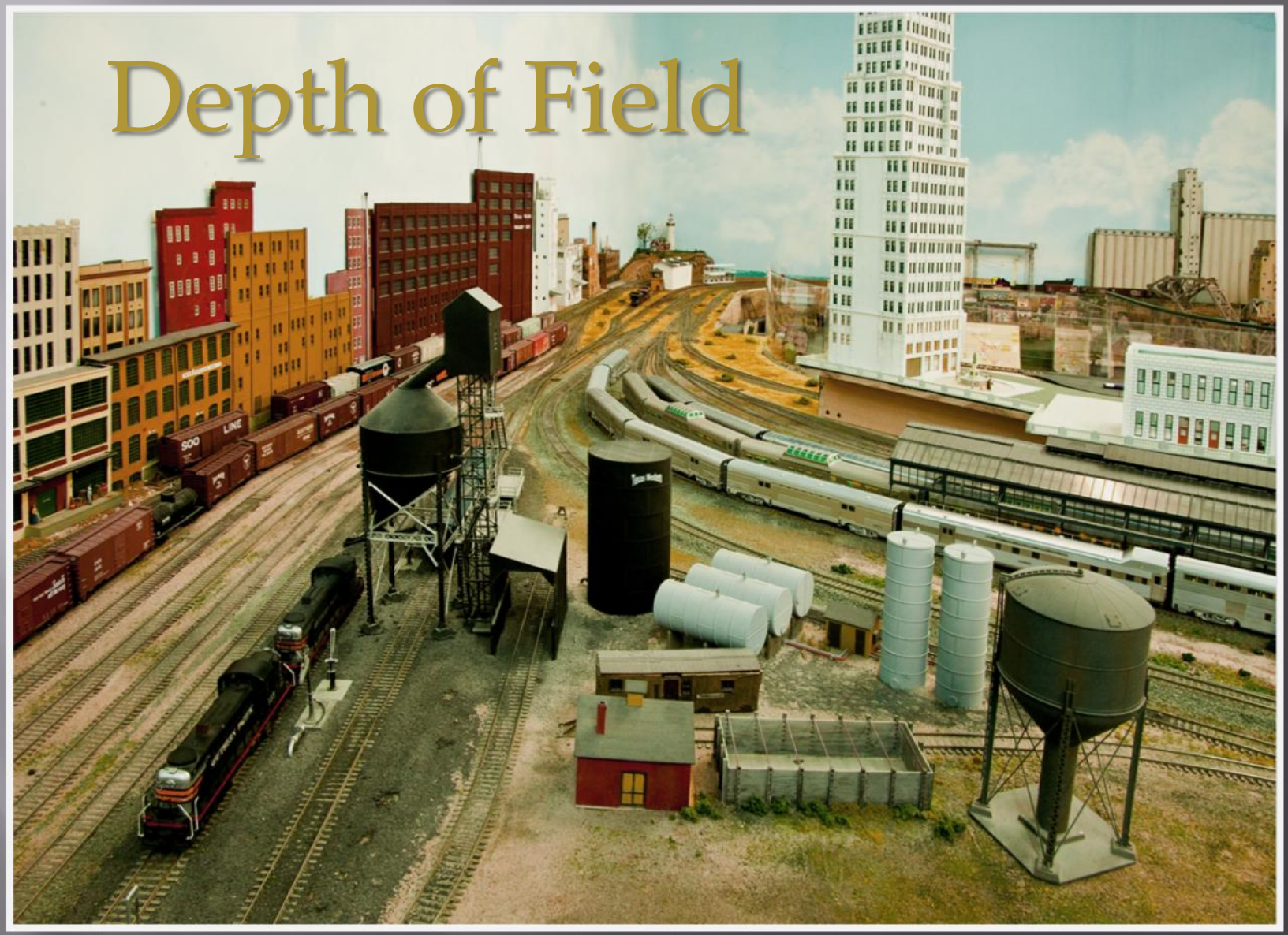
Furlow

What I Will Cover in This Clinic

- The Four Basics for Controlling Your Shot
  - Camera Basics (Manual Control)

1. Depth of Field
2. ISO
3. Exposure
4. White Balance

Depth of Field



Texas Western Railroad

Shot @ f-8 (the “f-stop”)

Shift in Focus Plane shows Approximately 18” in focus

Still @ f-8

Depth of field is greatly increased due to combining multiple focus points from foreground to background.

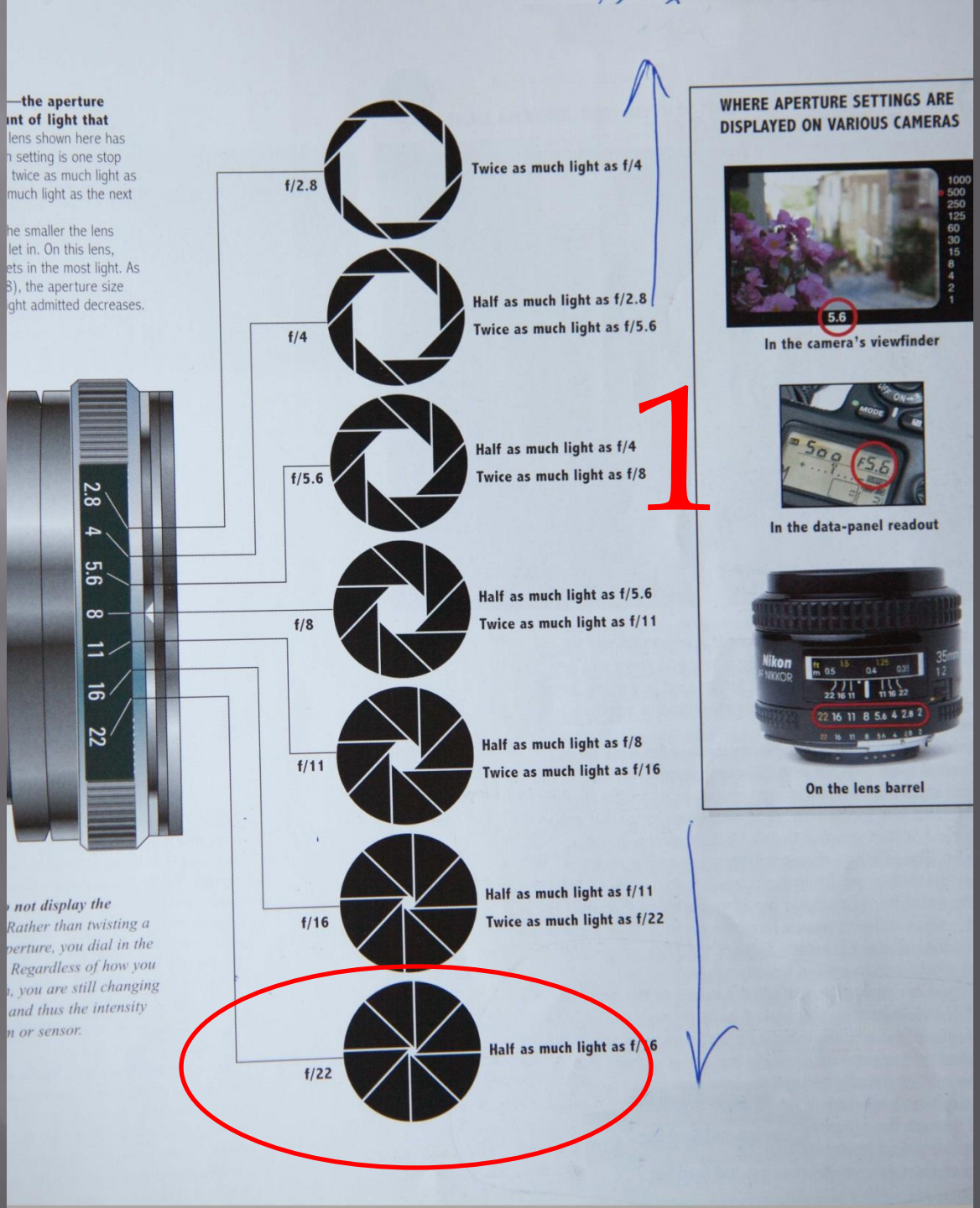
Controlling Depth of Field Three Things:

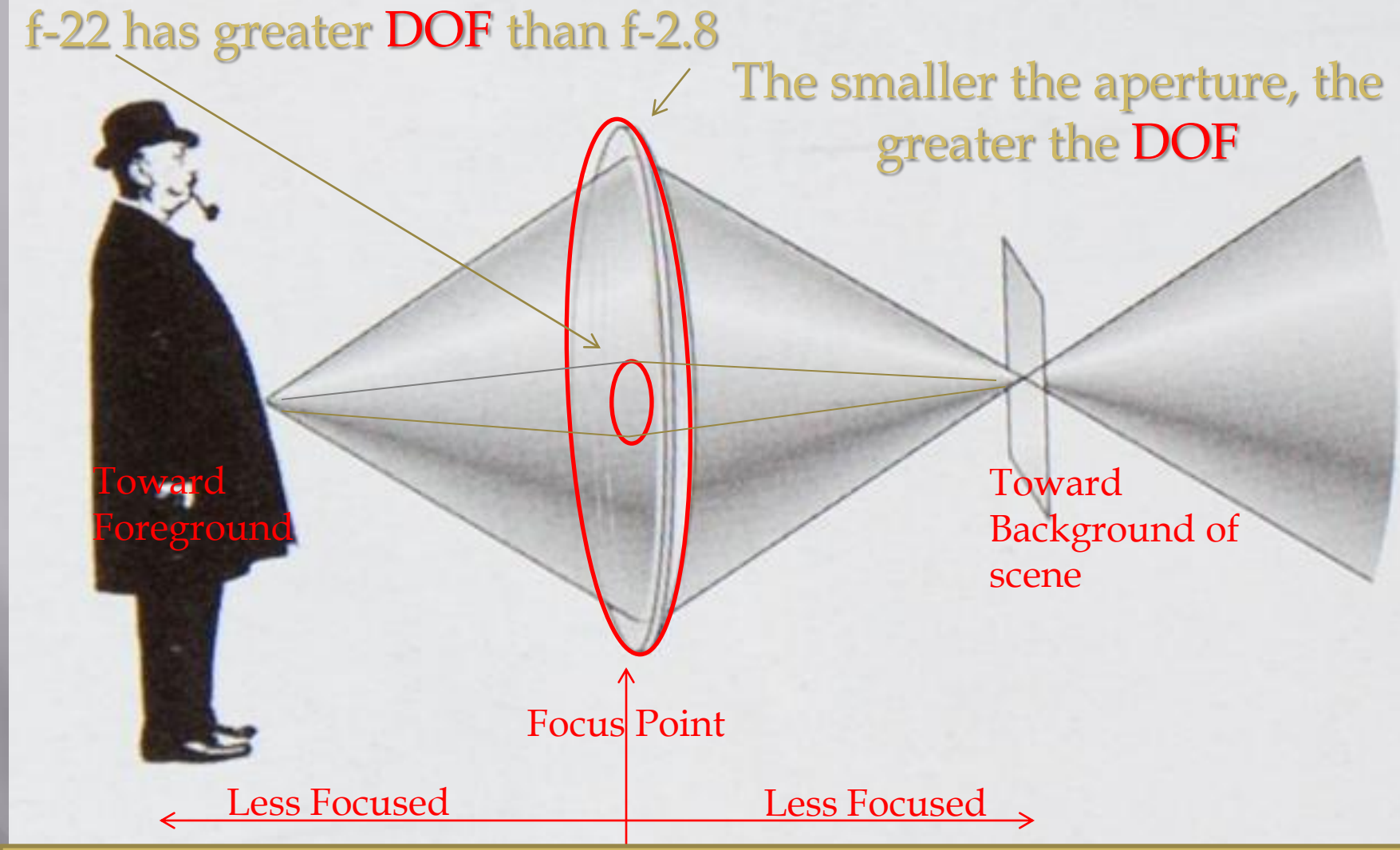
1. Aperture (f-stop)
2. Focal Length (zoom)
3. Closeness (of Lens) to the Subject

Aperture

- The numbers are like wire gage – the higher the number the smaller the wire.
- The higher the number – the smaller the opening and the less light will be allowed in at a given time length.
- F-22 because it is so small takes 6 doublings of time to be able to allow the amount of light @ f-2.8
- Remember the Texas Western shot was at f-8 at 1/4s.
- At the same ISO, an equivalent meter reading would be f-22 at 2 seconds.
- In other words, 3 times smaller opening requires 3 times more TIME to allow the same amount of light to reach the sensor.
- F-22 or smaller number is what we are looking for --- why???

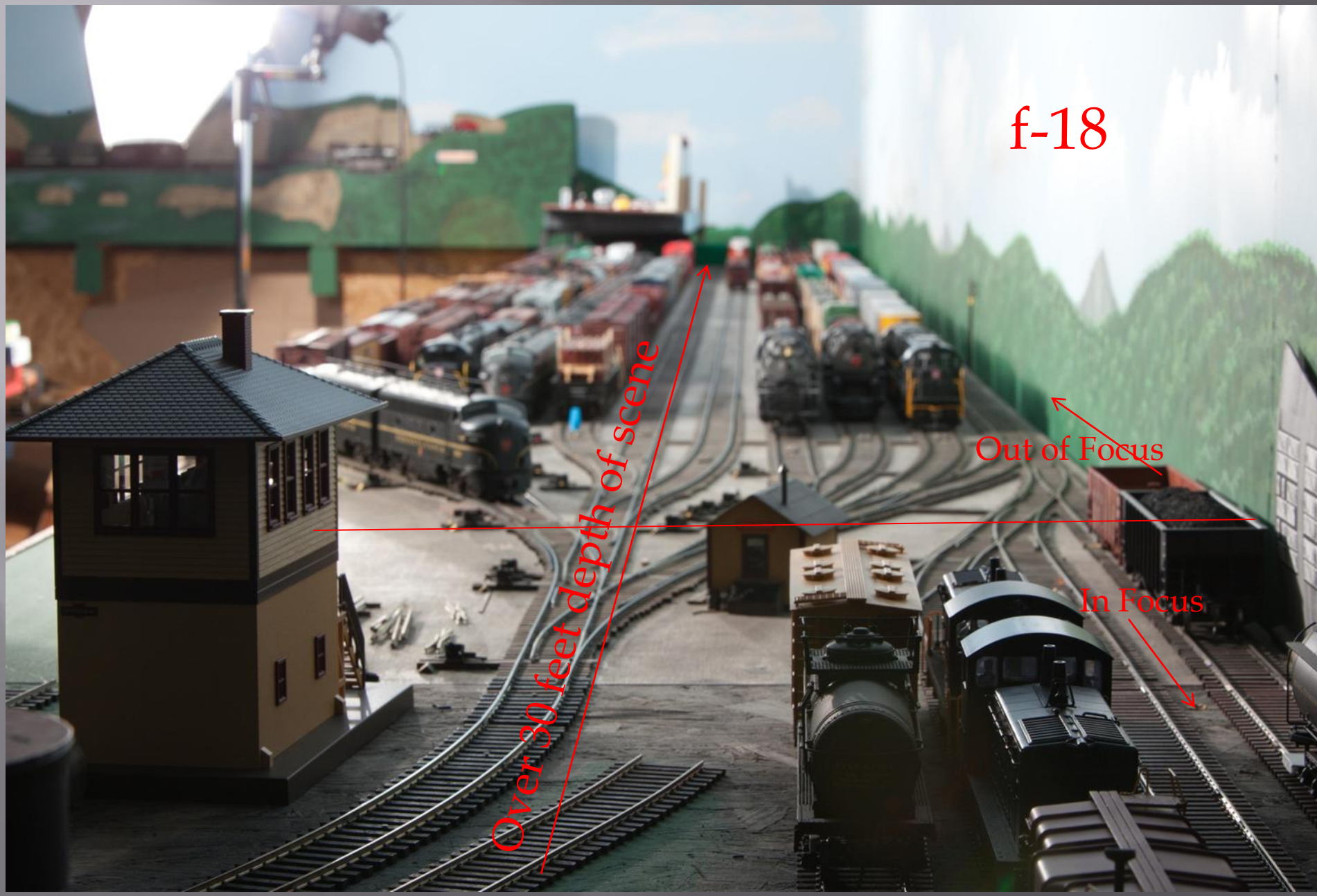
"DOF"





As the aperture becomes smaller (toward f-22 and higher), the cone elongates and the focus falls off less and less thus the scene appears more in focus throughout.

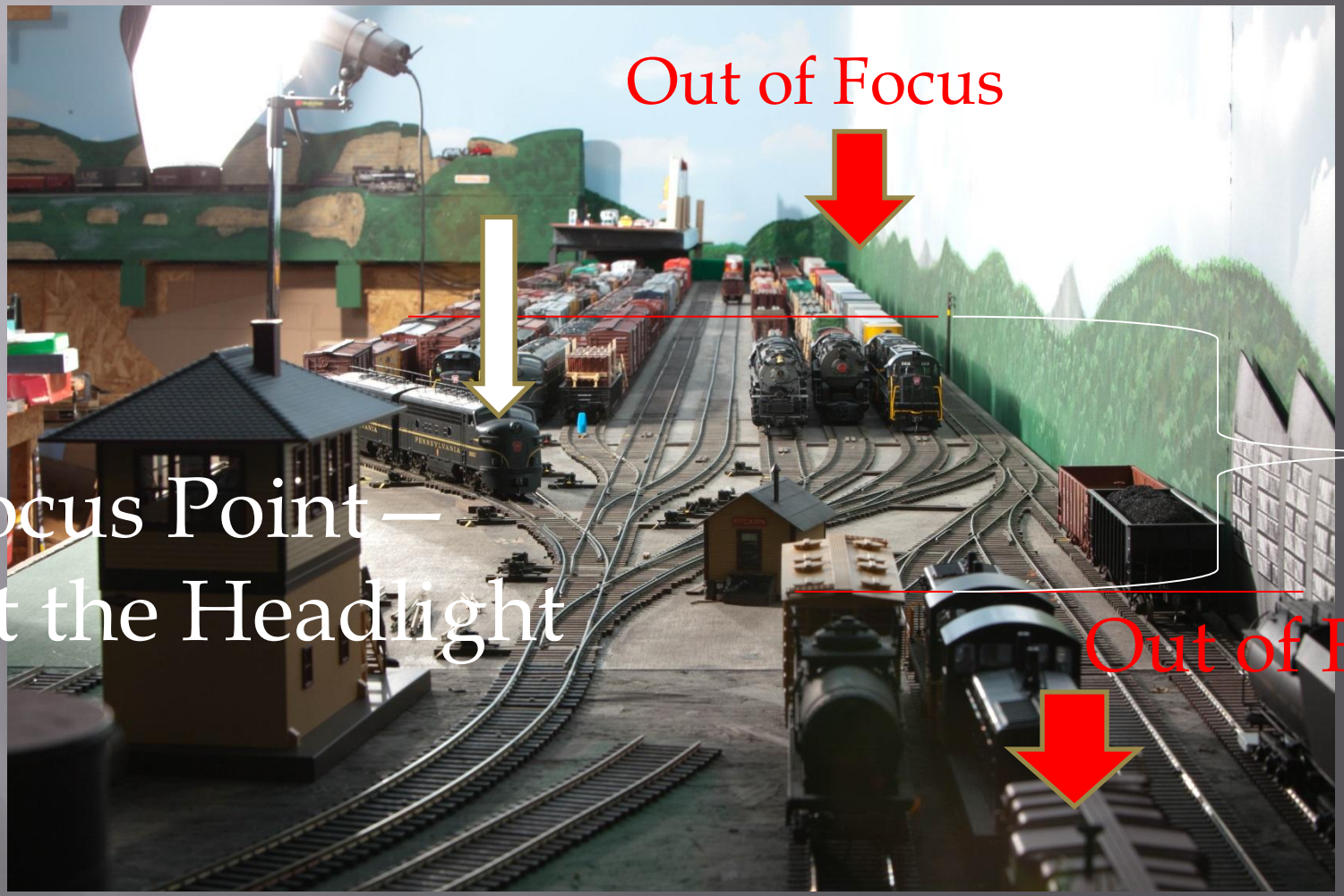
But EVEN at smaller apertures --- NOT everything is in focus!



Even Aperture of f-18 effects

DOF

(approximately 6 feet in focus)



Even at a smaller aperture of f- 18, total FOCUS is not achieved!

F-4?

?

?

F-8?

?

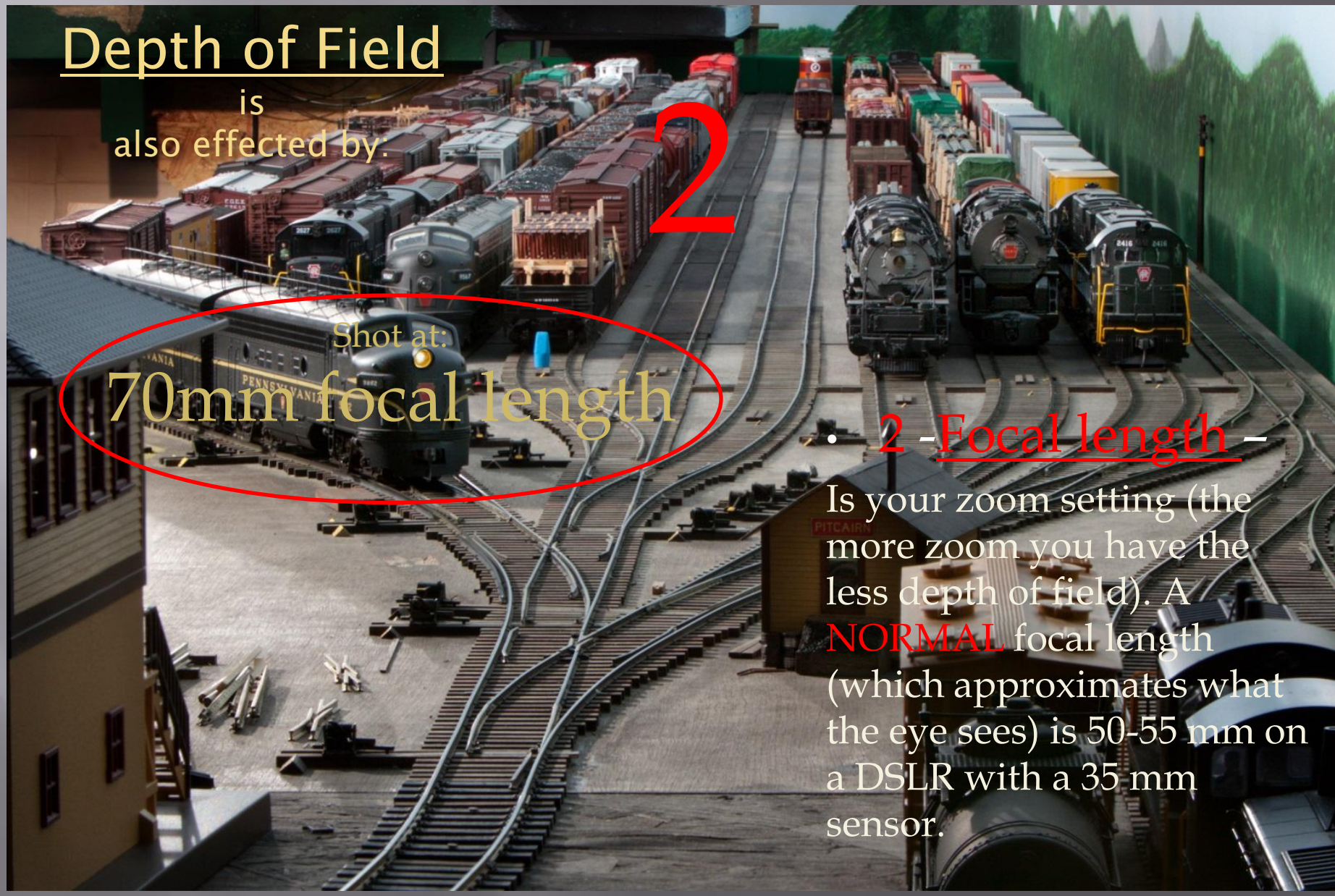
Questions?

F-18?

Can you find the f-stop setting on your camera?????

Controlling Depth of Field Three Things:

1. ~~Aperture (f-stop)~~
2. Focal Length (zoom)
3. Closeness (of Lens) to the Subject

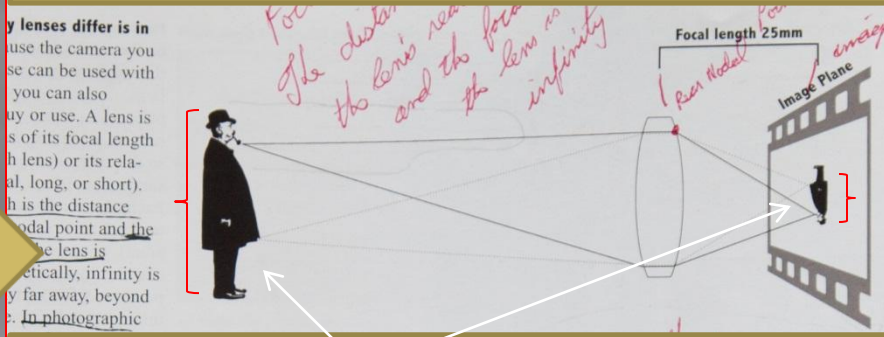

Depth of Field
is
also effected by:
2
Shot at:
70mm focal length
• 2 –Focal length –
Is your zoom setting (the more zoom you have the less depth of field). A NORMAL focal length (which approximates what the eye sees) is 50-55 mm on a DSLR with a 35 mm sensor.

"Wide Angle" Focal Length

--- 24 mm

Using a wide angle lens will introduce perspective problems also – but is software correctable.

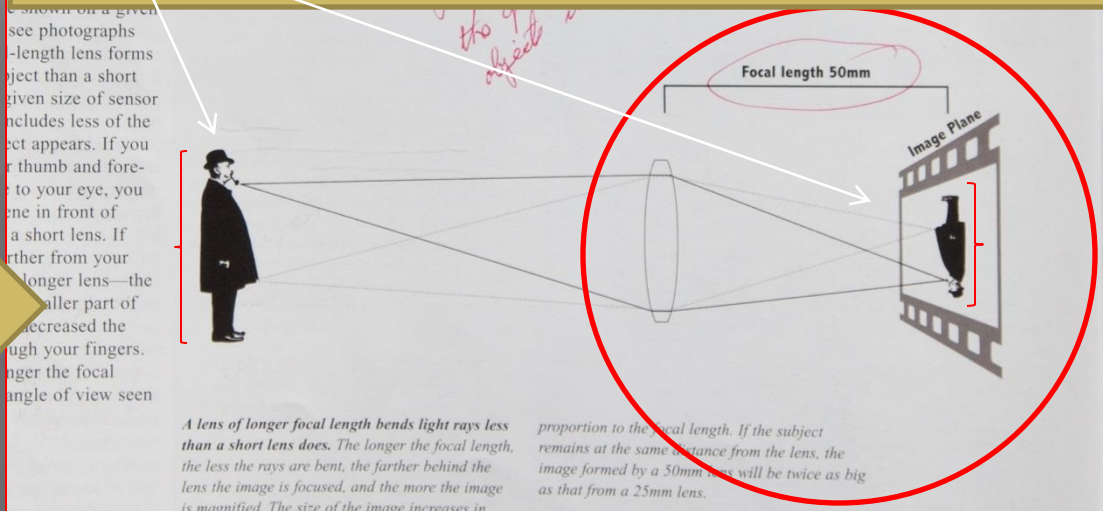
Gives you the best DOF -----BUT!!



Although 24 mm gives you the best DOF
50-55 mm gives you good DOF and more of a "life like" size.

Focal Length of 50-55 mm

50 mm



A lens of longer focal length bends light rays less than a short lens does. The longer the focal length, the less the rays are bent, the farther behind the lens the image is focused, and the more the image is magnified. The size of the image increases in proportion to the focal length. If the subject remains at the same distance from the lens, the image formed by a 50mm lens will be twice as big as that from a 25mm lens.

The closer the image is to a real life view size (approximately 50 mm), the better for a real life "track side" perspective. 50 mm is called a "NORMAL" lens (closest to life size view).

Controlling Depth of Field Three Things:

1. ~~Aperture (f-stop)~~
2. ~~Focal Length (zoom)~~
3. Closeness (of Lens) to the Subject

The third element to effect DOF is closeness of the barrel of the lens to the subject

FOCUSED

3

LAST OF 18 FOCUS PTS

Just moving back an inch or so would put the water tower on the bottom right into focus. As it was, the lens was just a bit too close to the water tower to focus properly.

Controlling Depth of Field Three Things:

1. Aperture (f-stop)
2. Focal Length (zoom)
3. Closeness (of Lens) to the Subject

Review

(How to achieve greatest DOF for Model RR Photos)

1. f-stop as high as possible:
   that is, f-22 or higher in number (smallest aperture available)

2. Use as close to a NORMAL focal length as possible:
   that is, close to 50-55 mm (what the eye sees in real life).

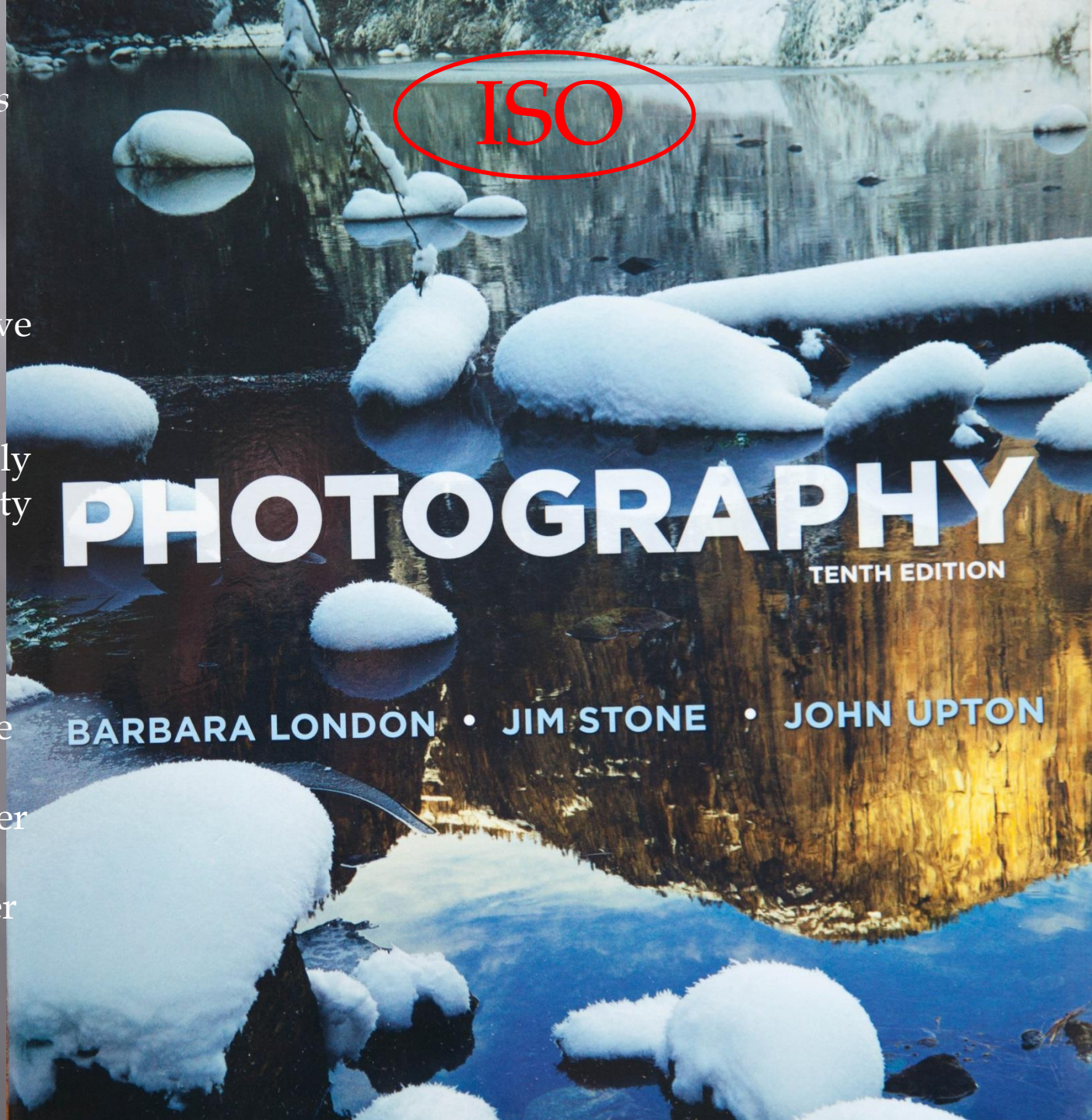
3. Remember, the closer your lens is to the subject, the more the Depth of Field is reduced.

- The Four Basics for Controlling Your Shot

1. ~~Depth of Field~~
2. ISO
3. Exposure
4. White Balance

Controlling

Stands for: *International Standards Organization* and is defined in the book **Photography** as a number which indicates how sensitive the sensor is to light. However digital sensors cannot actually change their sensitivity to light. Setting a higher ISO simply amplifies the data it collects. Because sensors produce more random data, called noise, in areas of lower illumination, photographs at higher ISO numbers have a higher proportion of unwanted pixels.



Noise in Dark Areas

Model Railroader's Guidelines

A Model Railroaders Guide to Digital Photography, a 29 page PDF found on MR's website under Contributor Guidelines (an excellent reference), you will find he suggests that an ISO of 100 is preferable for submission

IF we use an ISO of 100 and a very small aperture, we get the best quality (least amount of noise) in our layout photo

---however---

ISO 100 @ f-22 will require a very long exposure if adequate lighting is not on the model.

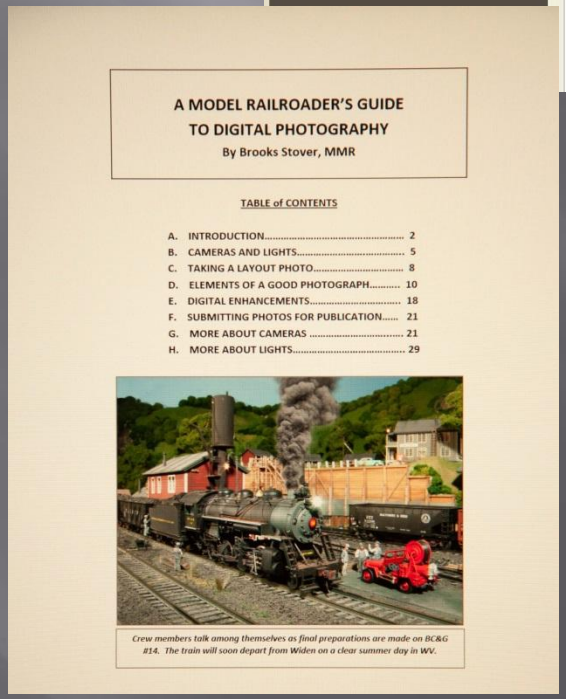
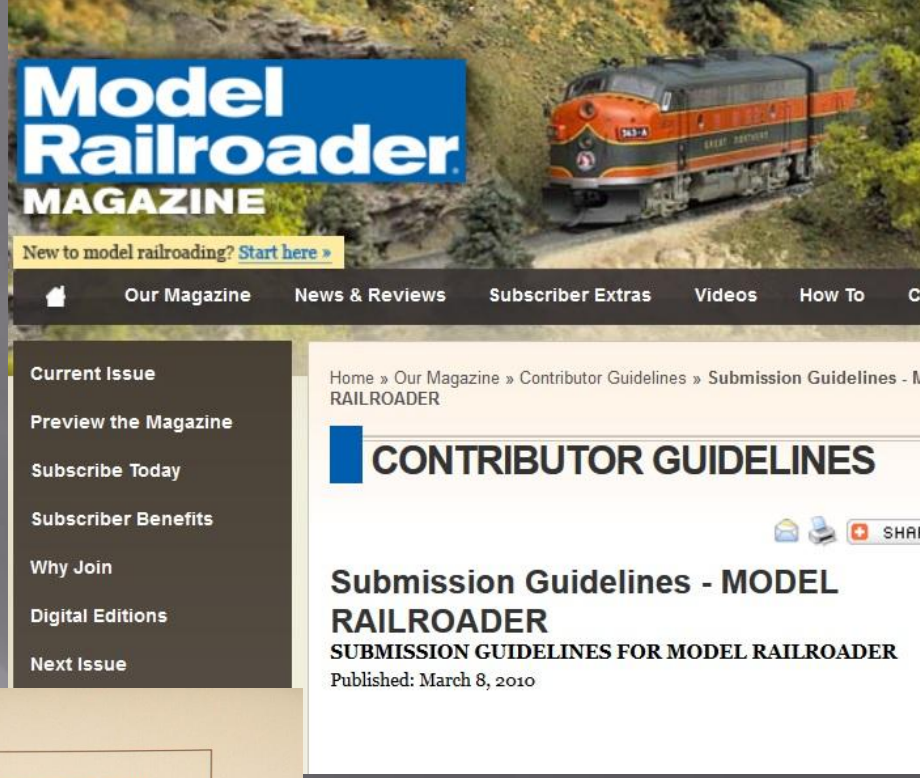

A MODEL RAILROADER'S GUIDE
TO DIGITAL PHOTOGRAPHY
By Brooks Stover, MMR

TABLE of CONTENTS

A. INTRODUCTION 2
B. CAMERAS AND LIGHTS 5
C. TAKING A LAYOUT PHOTO 8
D. ELEMENTS OF A GOOD PHOTOGRAPH 10
E. DIGITAL ENHANCEMENTS 18
F. SUBMITTING PHOTOS FOR PUBLICATION 21
G. MORE ABOUT CAMERAS 21
H. MORE ABOUT LIGHTS 29

Crew members talk among themselves as final preparations are made on BC&G #14. The train will soon depart from Widen on a clear summer day in WV.



Very long exposures create another type of noise called -----"dark noise"----- from heat generated electrons which accumulate over time.

Contributor Guidelines: In Brooks Stover's

- The Four Basics for Controlling Your Shot

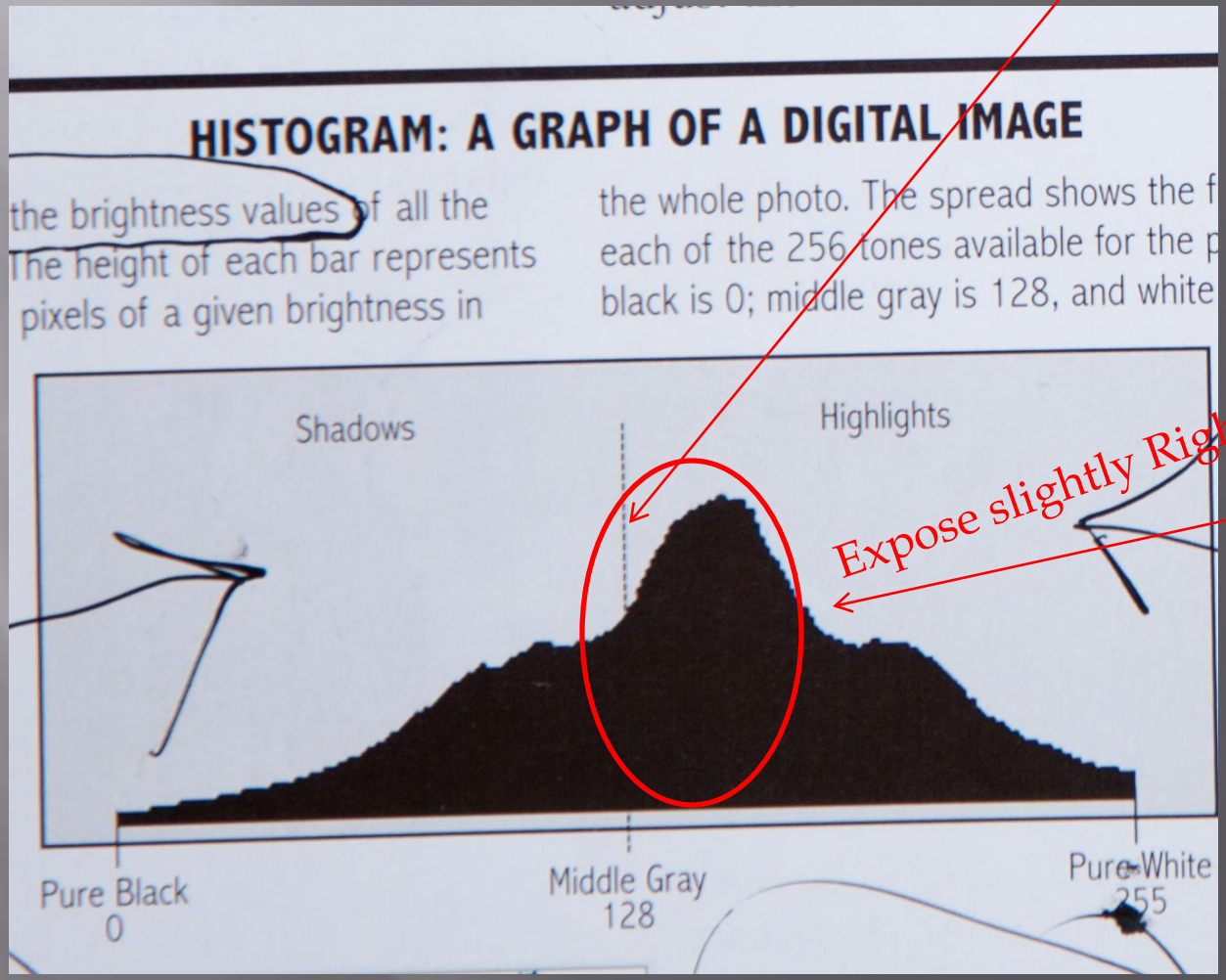
1. ~~Depth of Field~~ f-22
2. ~~ISO~~ 100
3. Exposure
4. White Balance

How do we get Exposure?

What is a Histogram

Brightness Values

Middle Gray



Pure Black

Pure White

Use a Gray Card to Obtain the Correct Exposure

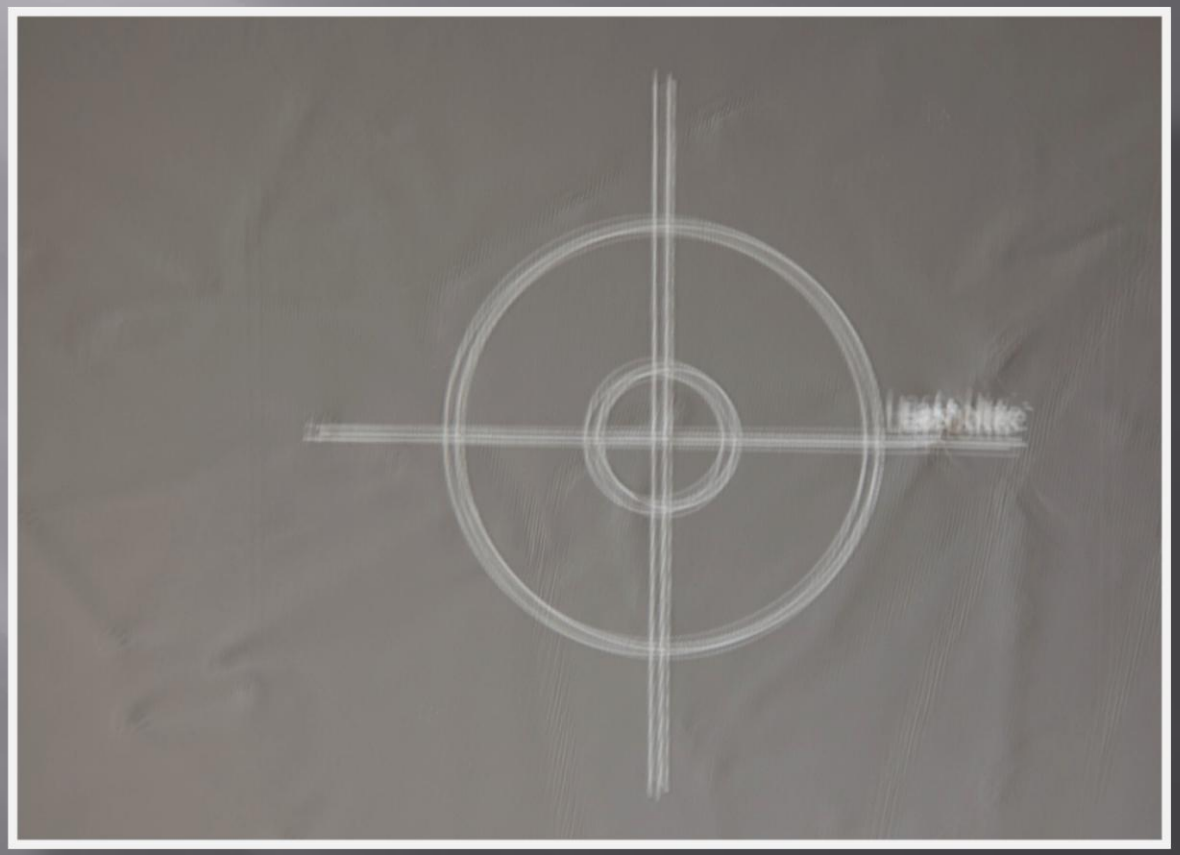
LASTOLITE
GRAY CARD

Gray Card Use

1. Place Card in front of camera
2. Oriented parallel to the sensor plane
3. After lighting established, place the card so existing and added lighting falls on the card.
4. Move your camera in and fill the screen with the gray card.

This is what you should see when you meter the Gray Card

The target is just to allow focusing (if auto-focus is on) – it does not need to be in focus to work for metering.

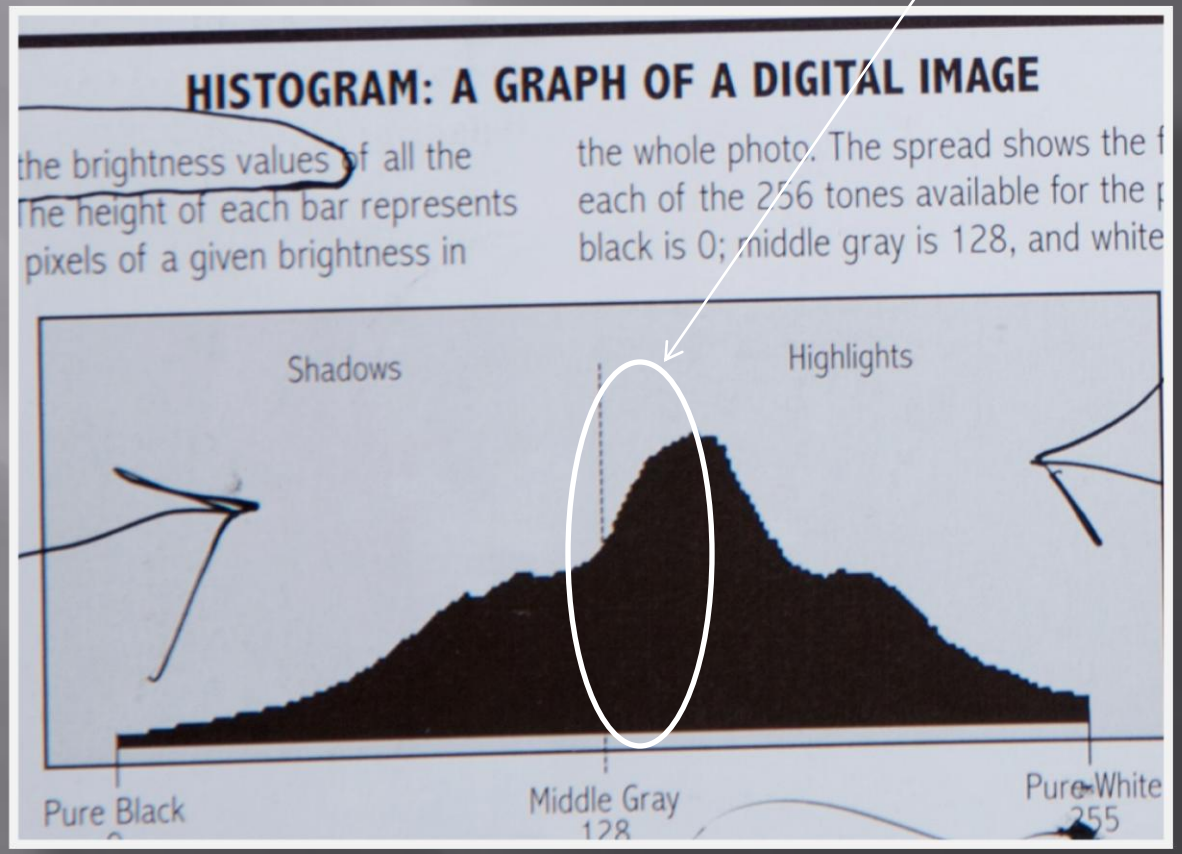


No frame or fingers should be visible in the image – just the gray card.

Setting the Shutter Speed

Fill the lens with the card, read the meter and click the button.
Check the Histogram (below) and adjust the shutter speed (longer or shorter) to move the spike as close to the center or slightly right of center (middle gray) as possible.

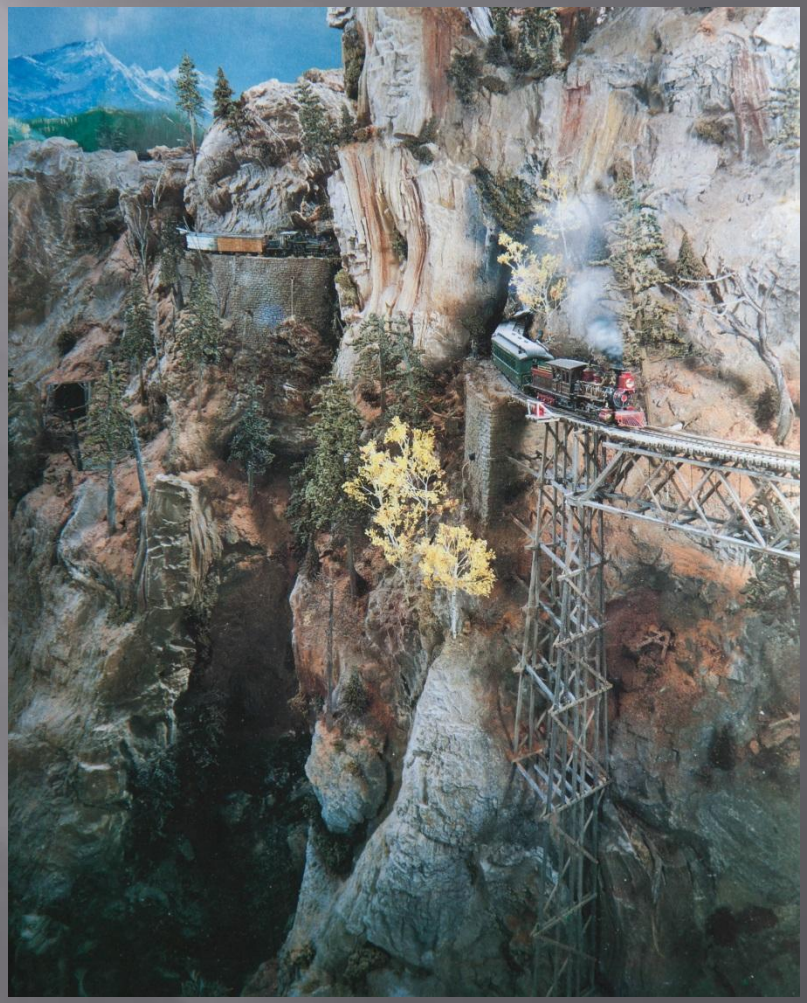
You do not want the histogram to spike up on the left or right. Spiking on either side can create printing problems.



If you spike left or right, it means your lighting is possibly too bright or too dim in light or dark areas of your scene.

Why Not Just Use My Camera Metering on the Scene?

What do you meter on for this scene?
Blue backdrop?
Gray hill side?
Engine?



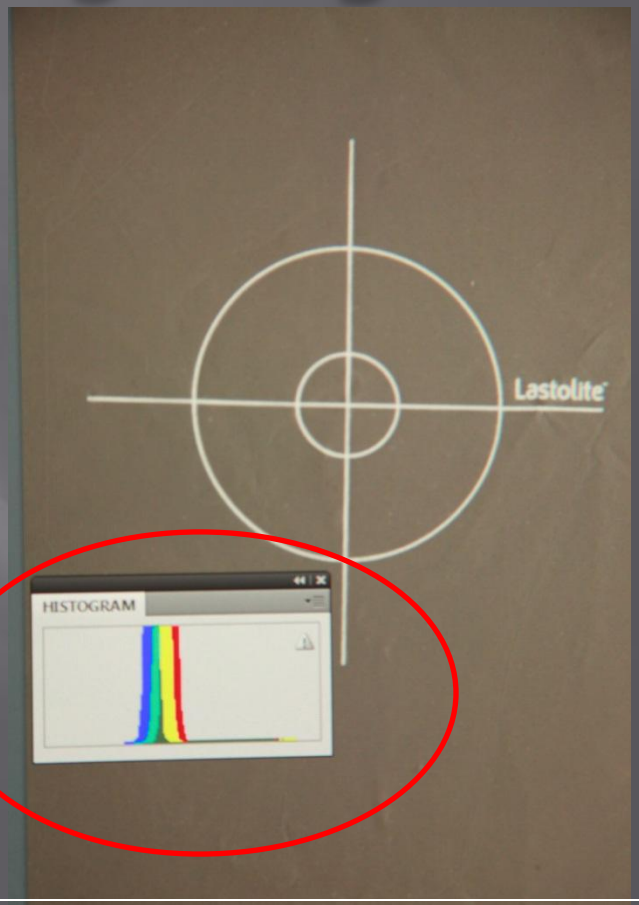
Even if you pick the correct spot, you're still somewhat guessing. Your camera meter is trying to make everything in the photo 18% gray. Why not use a GRAY CARD which is 18% gray?!!

Screen Shots

Both photos shot at f-5.6@1/13s under the SAME lighting!

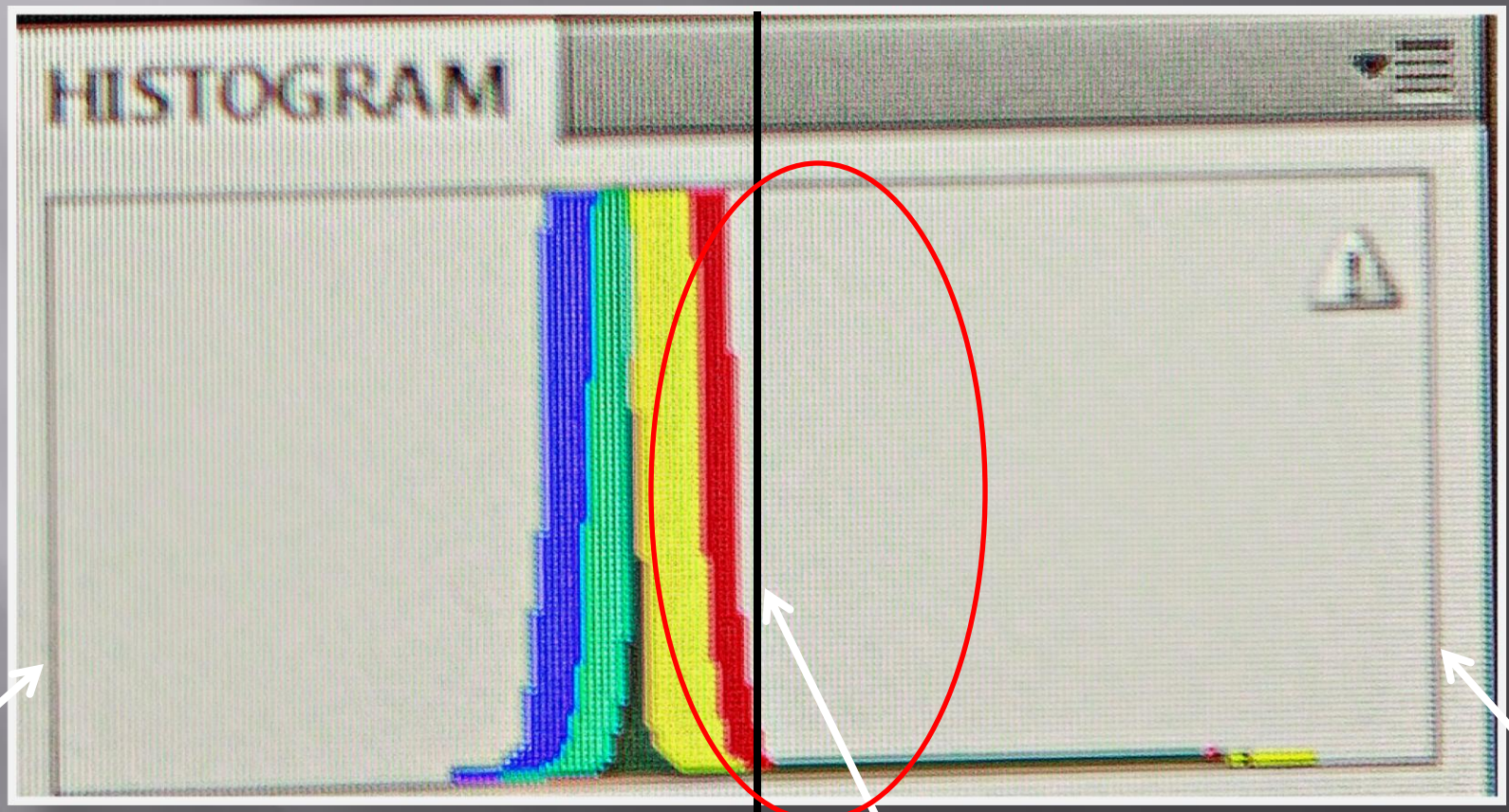
HISTOGRAM LOOKS EVEN & WELL EXPOSED

BUT…



THE GRAY CARD HISTOGRAM SHOWS THAT IT IS A LITTLE UNDEREXPOSED!

The Gray Card Histogram is always a spike which makes it easy to see the adjustment needed.



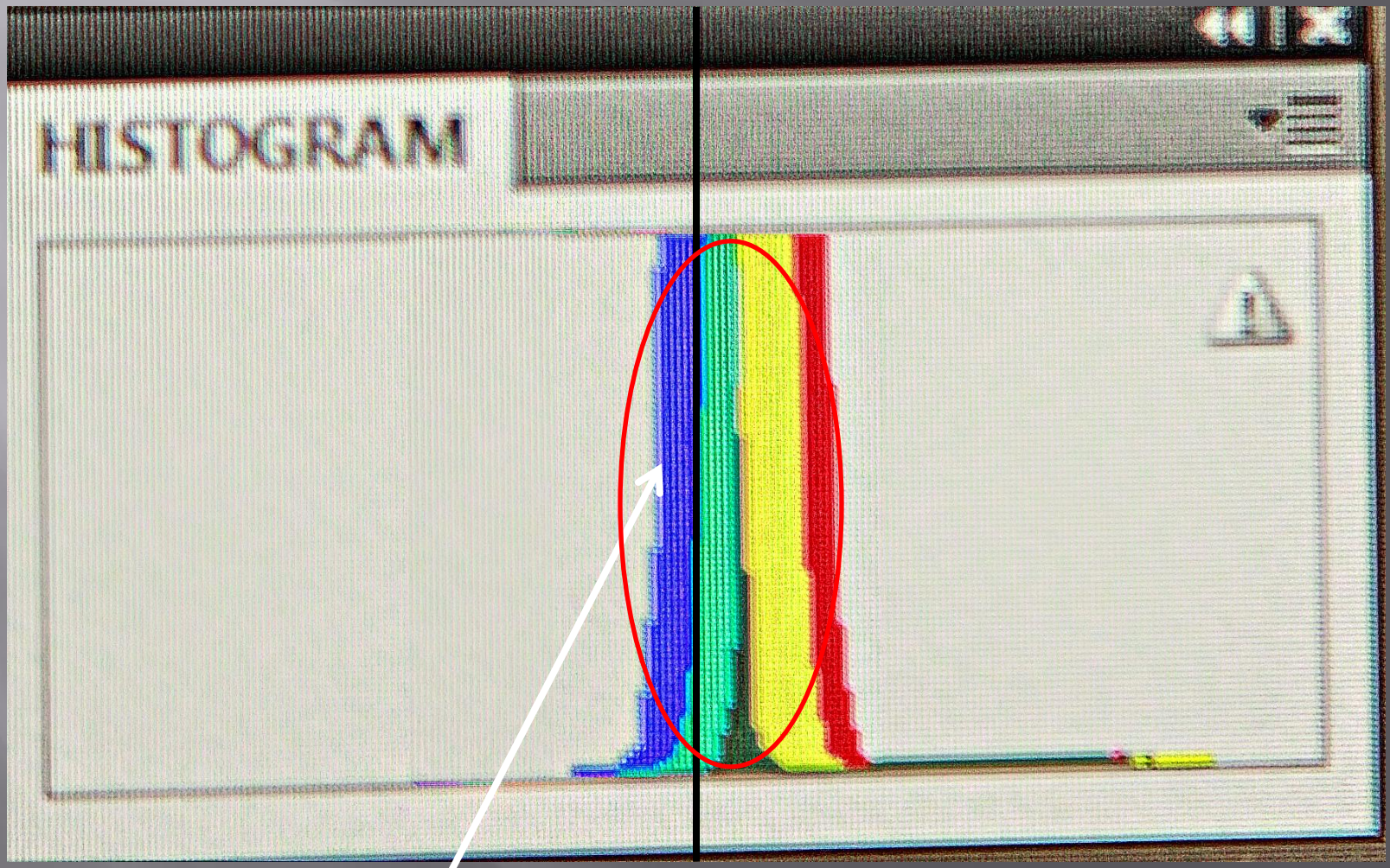
Pure Black 0

Middle Gray 128

Pure White 255

In this case the spike is a little left of center meaning it is underexposed. So, you must adjust the shutter speed for a longer exposure time to move the spike to the right of center.

This is how it should look



Middle Gray 128

Questions???

- There are no stupid questions!
- Ask away --- someone else has probably got the same question!
- Be the first to make me look bad!!

- The Four Basics for Controlling Your Shot

Controlling

1. Depth of Field
2. ISO
3. Exposure
4. White Balance

White Balance

- A White Card is used to fine tune your white balance which adjusts for color temperature of your lighting --- removes color cast or tint.
- One photo with a white card in the scene is desired by Model Railroader Magazine to make sure color is correct (see Stover's guidelines) for magazine printing.

Using the White Card

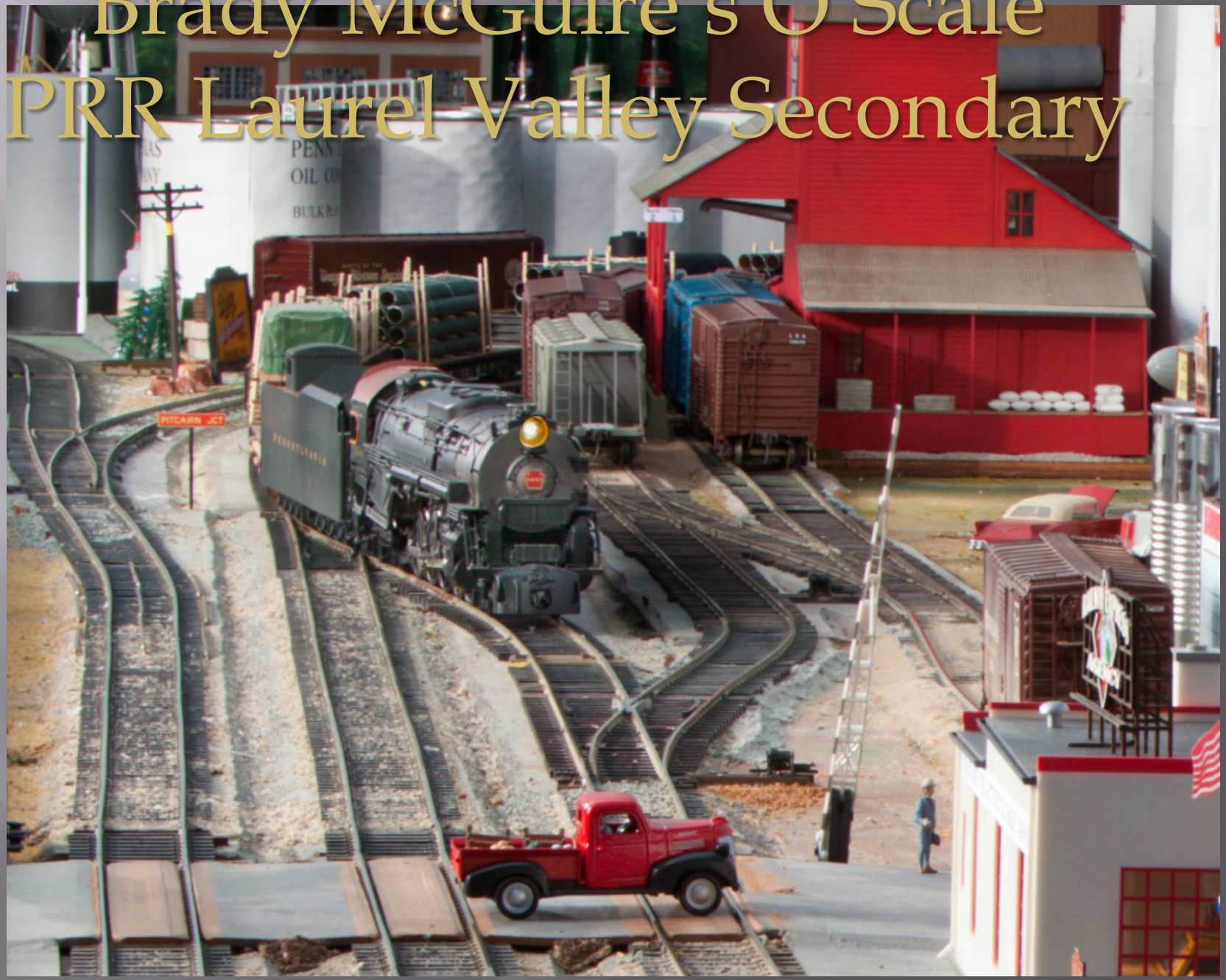
IMAGE HAS GREEN TINT

DUE TO FLUORESCENT CEILING LIGHTING

CORRECTED TO DAYLIGHT

Photoshop & Photoshop Elements have white balance eye droppers to click on this white panel to set the correct color of your scene. The image should be taken in RAW --- the eye dropper is in the RAW converter.

Brady McGuire's O Scale PRR Laurel Valley Secondary



What did we cover in this clinic?

Control of your camera! How?

- Depth of Field
  1. Aperture --- f-22
  2. Focal Length --- 50 mm
  3. Closeness to the subject --- check that at opposite ends of focus points (far to near) --- all objects are in focus.

- ISO --- set to 100 or lower (if your camera is capable of lower)

- Exposure --- Use a gray card

- White Balance --- Use a white card.

September Meeting
Part 3

Lighting Your Layout Photo

October Meeting
Part 4

Adding Smoke, Steam & Skies to Your Layout Photos

THE END OF THE LINE

QUESTIONS?